BULLETIN

of the

ONTARIO COLLEGE OF PHARMACY

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H. J. Fuller, Editor

CONTENTS

		Page
Biography of W. O. Austin	F. Towers	43
Forgeries - False Pretences - and Addiction to Schedule Drugs	T. E. E. Greenfield	44
Hospital Drug Costs	I. E. Stauffer	46
Pharmacy is Under Fire!	H. Charles Peacock	48
Major New Drugs of the British Pharmaceutical Codex, 1959	G. R. Paterson	50
The Low Cost of Living — An Appraisal for the Pharmacist	D. R. Kennedy	52
The Value of a Pharmaceutical Analysis Course to a Future Retail Pharmacist	F. W. Teare	57
Schedule F of the Food and Drugs Act		

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Vol. IX, No. 3 TORONTO, Ontario May, 1960

H. J. Fuller, Editor

The Ontario College of Pharmacy is the pharmaceutical licensing body for the Province of Ontario, Canada. All pharmacists licensed in Ontario are *IPSO FACTO* members of the College.

The majority of contributors to the Bulletin are members of the Faculty of Pharmacy, University of Toronto. However, contributions are welcomed from all members of the College.

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A BIOGRAPHY OF THE LATE MR. W. O. AUSTIN

President O.C.P. 1945-47

Affectionately referred to as the "Little Doctor" by "blacks" and "whites" alike, all came to the late Mr. W. O. Austin with their ills and troubles, and to each and everyone he gave advice and assistance. The pharmacists in the area rallied around him for guidance in moral and ethical standards of practice, for to them, Mr. W. O. Austin was a pillar of strength.

Mr. Austin was born in Simcoe, Ontario, June 11, 1885, and attended both public and high schools there. As a youth, Mr. Austin was one of the foremost athletes in the Simcoe area. His best sport was hockey, although he was an excellent tennis player as well.

Confident that pharmacy would be his career, Mr. Austin, went to the Ontario College of Pharmacy in Toronto and graduated in 1906. After graduation he went directly to Windsor, Ontario and served his apprenticeship under Mr. W. A. Pond of the Pond's Drug Store chain. For several years he was manager of the Wyandotte-Glengary St. store. He later bought the store which he named "Austin's Drug Store".

In this neighborhood of mixed races the "Little Doctor" earned the admiration and respect of each member of the community. Mr. W. O. Austin was a sincere Christian and attended the Central United Church. He was an active Mason, a member of the Great Western Lodge, Number 47 A.F. and A.M., a member of the lodge of Perfection, the Rose Croix, and the Moor Consistory. He was also a member of the Mocha Temple, London, Ontario, and the Morawas Shrine Club in Windsor. Having always been an enthusiastic golfer, he was a member of the Essex Golf and Country Club.

Chief DeFields of the Windsor Fire Department wanted a special paint for fire-alarm handles in the fire-boxes and Mr. Austin formulated a very satisfactory preparation. It contained acriline dye, petroleum, alcohol and glycerin. He was responsible for this paint until his death, at which time the Fire Department undertook its preparation.

For the forty years of his active business life in Windsor, the Windsor pharmacists relied upon his judgment as a diciplinary factor for the ethical practice of their profession. He would fold his hands behind his back, stand firm and straight to philosophize as he gazed into the eyes of those seeking advice watching for a facial expression to acknowledge full understanding and acceptance of his words.

Mr. Austin represented the Windsor area on the Ontario College of Pharmacy Council for 10 years. In 1945 he was elected President of the Council and Mr. Mercer called Mr. Austin to the chair. "He congratulated Mr. Austin on his preferment and wished for him the same enthusiastic co-operation that he had received. Mr. Austin thanked the members for their confidence, and said he looked upon his election as the highest honour his brethren in Pharmacy could bestow upon him. He assured them of his endeavour to be loyal to that confidence, and to conduct the affairs of the College with the dignity the position warrants."

During the next year he exhausted his strength in the service of his fellowmen. Mr. Austin, having returned from Vancouver where he represented Ontario at the C.Ph.A. Convention, died on October 29th, 1947.

"Mr. Mitchell referred to the great loss sustained by the Council in the passing of President W. O. Austin. His entire business career had been devoted to work on behalf of the associations of pharmacy, and not only in that field but in the work of service organizations and the Church he had laboured well and faithfully. Not only this College but many other associations to-day acknowledge their loss. The members of Council were then asked to rise and observe one minute's silence in memory of our late friend."

FRED TOWERS.

FORGERIES - FALSE PRETENCES - AND ADDICTION TO SCHEDULE DRUGS

Case 1.

Married woman, 28, boy 11, girl 8, forged prescriptions for Methedrine and passed them at one pharmacy. Obtained 1200 Methedrine tablets from January 4, 1960 to March 31, 1960, an average of 14 per day. When arrested by city police in company with the Inspector on a charge of Forgery, she was in the throes of withdrawal, a pitiful sight. Said if she had 8 pills to take she would be fine. While in custody, she was examined by 2 physicians who certified her addicted and she was committed by the Magistrate to an Ontario Hospital for a cure for her addiction. The husband did not know of her addiction and forgeries but said she acted strangely and was "hard to live with". In 1956 she had been picked up by city police for forging the same prescription and allowed to go on a warning. She did not desist from her forgeries but has passed them once a week at other pharmacies.

Case 2.

Two nurses obtained 100 Noludar on February 29, March 9, 17, 18, 23 and 26 at pharmacies on ℞'s signed by internes of a hospital. In addition they bought quantities of APC & C1/8.

Case 3.

Woman, single 36. Forged ℞ for Desancobarb fl. oz. vi, which she scattered around in pharmacies and took ℥vi every 2 days. Charged with Forgery and committed by 2 physicians to a provincial hospital for treatment for her addiction.

Case 4.

Woman, married, 4 small children forged ℞'s for Methedrine, former drug clerk in England. Wrote a convincing forgery. Obtained Methedrine in 100's, a former inmate of a provincial hospital.

Case 5.

Man, 60, phoned various pharmacies every few days representing himself as a doctor and ordering 50 Seconal to be called for. He died.

Case 6.

Physician not in public practice wrote ℞'s for office use and scattered them in various pharmacies. 1550 Methedrine, 5 mgm., obtained in the month of June for his own use.

Case 7.

Dentist in practice obtained between May 25th and July 16th, 255 Dexedrine Sulphate, 5 mgm., and 195 Seconal Sodium, gr. ¾, for his own use.

Case 8.

Physician in practice, formerly on Restricted Narcotic list, wrote ℞'s for a total of —

286 Seconal Sod. gr. i ss
80 Nembutal gr. i ss
120 Benzedrine 10 mgm.
12 Tuinal —

between September 17th and October 14th for office use. His orders always called for Saturday Evening Post and a package of Players.

From these you may conclude that Barbiturates and Amphetamines are habit forming. If you encounter unusually large amounts of these or other Scheduled drugs being obtained, notify the Inspector immediately. In so doing, you may be instrumental in preventing a serious condition from becoming one of addiction.

April 13, 1960. T. E. E. GREENFIELD,
Inspector.

WASHINGTON, April 28:—A proposal to take medical discussions on the pros and cons of drugs out of the Kefauver committee hearing rooms and into the scientific atmosphere of a medical symposium was urged today by John E. McKeen president of Chas. Pfizer & Co., Inc.

The Pfizer company and Upjohn company have been appearing before the Committee which is presently holding hearings on all antidiabetic drugs.

Hearings of the Committee yesterday ended up in an argument among a number of specialists as to the relative merits of oral antidiabetic drugs — drugs taken by mouth to treat diabetes.

The proposal of Mr. McKeen was made in a letter to Sen. Estes Kefauver, chairman of the Subcommittee on Antitrust and Monopoly of the Senate Committee on the Judiciary.

In his letter Mr. McKeen endorsed a suggestion made by Dr. Alexander Marble of the Joslin Clinic of Boston who, testifying before the Committee yesterday, proposed a symposium for full discussion of doctors' experience with oral antidiabetic drugs.

Mr. McKeen pledged full cooporation of the Chas. Pfizer Co. in support of such a symposium.

"All of the pharmaceutical companies" he said "including our own Company make it a practice to encourage such symposia in order that doctors may be fully informed upon the usefulness of drugs for treatment in their patients."

In his letter to Sen. Kefauver, McKeen said, "I seriously wonder whether the hearings have not gotten into an area where they do not intend to be or properly belong." Mr. McKeen indicated he felt the Committee should not hold such discussions.

HOSPITAL DRUG COSTS

The Hospital Services Commission Act of the Province of Ontario stipulates that it is the function of the Hospital Services Commission of Ontario to administer the plan of hospital care insurance established by the regulations set forth under the Act. It also empowers the Commission to determine the amounts to be paid to hospitals and to make these payments for insured services provided to insured persons under the plan. Furthermore, the Act states that it is the function of the Commission and it has the power to control charges made to all patients by hospitals in Ontario to which payments are made under the plan of hospital care insurance. Lastly, subject to the approval of the Lieutenant-Governor in Council, the Commission may make regulations making such arrangements as are necessary to ensure that adequate standards are maintained in hospitals.

Since drugs, biologicals and related preparations, with the exceptions of preparations sold under the Proprietary or Patent Medicine Act (Canada), are included in services to in-patients under the plan, one wonders what interpretation will be given to the term "adequate standards"? It is to be hoped that purity, potency, reliability and pharmaceutical excellence will not be sacrificed for attractive economical considerations, if patient safety is to be maintained.

The selection of safe and effective therapeutic agents for patients in hospitals is a grave responsibility. Physicians and pharmacists agree that the establishment of a Pharmacy and Therapeutics Committee is the best method of solving this problem. Composed of members of the medical staff and the pharmacist, this Committee is designated as a special committee of the medical staff and is appointed by the president of the medical staff. Its purpose is to advise the medical staff and the hospital administration on all matters pertaining to the use of drugs in the hospital. Because of its potential contribution to better patient care this committee is strongly recommended for all hospitals by the Canadian Council on Hospital Accreditation.

The establishment of Pharmacy and Therapeutics Committees in individual hospitals has been so successful that one province has seen fit to adopt this method of setting up an advisory body to assist the physicians and hospitals with problems pertaining to drugs. The following editorial and committee bulletin reprinted from the **Alberta Medical Bulletin, 25**: 18-20, February, 1960, include several recommendations of this Joint Pharmacy Therapeutic Committee and warrant further study by interested pharmacists and physicians in Ontario.

"EDITORIAL
HOSPITAL DRUG COSTS

The Joint Pharmacy Therapeutic Committee established under the Hospitalization Benefits Act Regulations requests the continuing co-operation of the medical profession of the Province in the supervision of hospital drug costs.

It is the belief of this committee that the treatment of the patient in hospital can be most efficiently and effectively carried out if drugs can be freely prescribed by the physician as he believes indicated, and supplied through the local hospital.

The alternative to this would appear to be central purchasing of drugs for hospitals by Government, using an approved list. Drugs not on this approved list would presumably not be paid for under hospitalization benefits.

The Joint Committee with representatives of the medical profession and the hospital association meets monthly. Some suggestions have been made and these are enumerated elsewhere in this issue of the Bulletin. Further communications will be made from time to time.

It is our hope that hospital drug costs can be kept at a reasonable level, and if so we believe central purchasing on a restricted list of drugs will not come to pass.

Joint Pharmacy Therapeutic Committee.

COMMITTEE BULLETINS
HOSPITAL PHARMACY BULLETIN

The Joint Pharmacy Therapeutic Committee was established by the College of Physicians and Surgeons and the Associated Hospitals of Alberta to serve as an advisory committee to the sponsoring organizations and their respective members — the physicians and hospitals of the Province. Regulations under the Hospitalization Benefits Act designate the committee as the official advisory body in hospitals of a size less than 180 beds.

A number of meetings of the committee and its sub-committees have been held. The following is a resume of the committee's general recommendations to date.

Hospital Pharmacy Therapeutic Committees

Each hospital should have its own pharmacy therapeutic committee to advise its medical staff and administration on all matters pertaining to the use of drugs in the hospital. Minutes of all meetings of the committee should be kept, recording its decisions and recommendations. It would be very helpful to the **Joint** Committee if it could be supplied with a copy of the minutes of hospital pharmacy therapeutic committee meetings and of any reviews which such committees make on approved or rejected drugs so that these may be considered for inclusion or deletion from the formulary.

If hospital pharmacy therapeutic committees are seeking a guide in selecting drugs for use in their hospitals, the committee suggests that "The Medical Letter on Drugs and Therapeutics" might be found helpful. This is published by Drug and Therapeutic Information Incorporated, 136 East 57th Street, New York 72, N.Y., U.S.A., and the cost is $12.50 per year.

Drugs Stocked by Hospitals

Wherever possible, preparations supplied should be those found in the "British Pharmacopeia," "United States Pharmacopeia," "New and Non-official Drugs," or "The Canadian Formulary," rather than proprietary preparations. Only quality products from reputable manufacturers should be purchased and utilized; false economy harms only one person—the patient.

Basic drug products should be stocked and used in preference to product combinations. The latter lead to unnecessary duplication and increased costs. Unnecessary duplication in the same basic drug, under a variety of trade-names should be avoided, where there is a multiple choice, a limited maximum should be kept on hand.

Use of Formulary

The Committee strongly advises that every hosiptal use a formulary which lists all drugs approved for use. For hospitals which have not developed their own, the Committee recommends that the Formulary of the University Hospital be adopted as a basic formulary and amended as required.

Copies of the University of Alberta Hospital Formulary are available from the hospital at a cost of $5.00 each.

Automatic Stop Orders

Unless the physician's order indicates the exact number of doses to be administered or specifies the exact period of time during which medication is to be administered, or unless the physician re-orders the medication, all drug orders for the items specified should be automatically discontinued as follows:

1. Narcotics, sedatives, hypnotics and anti-coagulants—after 48 hours.
2. Antibotics—after 5 days.

Committee Mailing Address

Enquiries and correspondence may be addressed to:

The Secretary, Joint Pharmacy Therapeutic Committee,
P.O. Box 427,
EDMONTON, Alberta."

I. E. STAUFFER.

PHARMACY IS UNDER FIRE!

Why should we as pharmacists have to be dragged through the columns of our national newspapers, radio and television in such ridiculous fashion? Why is Pharmacy made the butt of all the jokes of end-men and comedians that gallop across our stage and screen? Why do politicians seek out pharmacy as a scape-goat for errors of omission or commission and for vote gathering by mass hysteria? I have asked myself this question many times in the past and find myself asking it twice a day of late. Haven't you?

Being an optimist at heart and always looking for something good in everything and everybody I would ask you to look for a moment at the problem, objectively.

With the utmost sincerity that I can bring to bear on the subject I firmly believe that the "truth lies through education". We have tried, during the last fifty years, almost every other known panacea without too much success. If we as Pharmacists ever expect to take our rightful place alongside the other members of the health team, the Doctors, Dentists and Nurses, it can only be accomplished through "higher academic standards".

For some of we oldsters this may be painful for a time but to the new crop of youngsters coming along to take our place we hope they will find in this "brave new world" new horizons of hope and responsibility.

As undergraduates of the "Faculty of Pharmacy", they will fraternize with young people in all the professional faculties.

As graduates they will in many cases carry on their life's work shoulder to shoulder in community efforts with these same university-made friends. How else can respect for Pharmacy become a reality?

I am convinced we owe posterity a legacy. Now is the time for each of us as pharmacists to show our fellow professional graduates, the doctors and dentists, that we can match their efforts in this regard right up to the last penny. Here are a few facts as to how we stood in "The National Fund for the University of Toronto" as of February 22nd, 1960.

1. The average donation up to this date and with little change since is, Medicine $270.00; Dentistry $150.00; and Pharmacy $90.00. The total average gift for all Faculties is $187.00.

2. The percentage of alumni participating by gifts is, Medicine 39%, Dentistry 61%, Pharmacy 15%. The total average participation for all Faculties is 36%.

So you can see in both cases Pharmacy is not even half as good as average.

Without appearing a bit sacrilegious we say "Thank God for the 15%." Those stalwarts of pharmacy who see the light and have shown in a tangible way their hope for the future of our profession.

When Pharmacy moves into its "New Home on the Campus" in September, 1961 it is the wish of our beloved Dean Hughes that every pharmacist who is a graduate of the Faculty of Pharmacy, University of Toronto will take some part, large or small, in its opening. The doors will swing open and Pharmacy will be proud that day, whether you have contributed a gift of money to the National Fund or not. Pharmacy is under the eagle eye of the men and women of the other professional Faculties. The most important factor is to make certain that we hold our end up financially so that we can hold our heads up high with self-respect.

Some day we will write to you about other alumni matters but remember this. Whether you pay or whether you don't—whether you know it or whether you don't—whether you wish to or not—as a graduate of the Faculty of Pharmacy of the University of Toronto you are an alumnist of the U. of T. and automatically are a member of the U. of T. Alumni Association. This responsbility you can't escape as long as you draw the breath of life.

It is your birthright. It will bring honour to you if you honour it.

Herein lies the answer to a great many of the problems of Pharmacy today. If we stick together and each pulls his weight financially almost all the fires will quench themselves.

H. CHARLES PEACOCK.

MAJOR NEW DRUGS OF THE BRITISH PHARMACEUTICAL CODEX, 1959

The new British Pharmaceutical Codex has been issued, is now official and is for sale at $14.00. It may be obtained from the University of Toronto Book Store, Toronto 5, Ont.

In tabular form there are presented the major new admissions to the B.P.C. In addition to the approved name there are given the use or indications for each drug, and the commercial availability where this is known.

This information is reproduced through the courtesy of Jas. F. Henderson, Editor of the Canadian Pharmaceutical Journal.

B.P.C. Name	Indications	Commercial Availability
Aminometradine	diuretic (in mild congestive heart failure)	Mictine (Searle)
Amiphenazole Hydrochloride	analeptic (to reduce drowsiness and respiratory depression of morphine, etc. in terminal cancer)	Daptazole
Bemegride	analeptic (for barbiturate and chloral hydrate poisoning)	Megimide (Abbott) Mikedimide (Panray)
Benactyzine Hydrochloride	tranquillizer	Actozine (Maney)
Benethamine Penicillin	long-acting antibacterial	Benapen (Glaxo)
Busulphan	in chronic myeloid leukaemia	Myleran (B. & W.)
Chloramphenicol Cinnamate and Palmitate	wide-range antibacterial	Chloromycetin (P.D.)
Chlorothiazide	diuretic	Diuril (M.S.D.)
Chlorotrianisene	menopausal disturbances and relief of prostatic cancer	Tace (Merrell)
Choline Theophyllinate	bronchodilator in bronchial asthma, Diuretic, Vasodilator in management of angina pectoris	Choledyl (Warner Chilcott)
Crotamiton	antipruritic, scabicide	Eurax (Geigy)
Dequalinium Chloride	infections of gums, mouth and throat	Dequadin (A. & H.)
Dextromethorphan Hydrobromide	cough supressant	Romilar (Roche)
Dicyclomine Hydrochloride	treatment of peptic ulcer and pylorospasm	Bentylol (Merrell)

Major New Drugs of the British Pharmaceutical Codex, 1959—(Cont.)

B.P.C. Name	Indications	Commercial Availability
Dimethicone 20	in cream to prevent bedsores, etc.	a Silicone
Dipipanone Hydorchloride	potent analgesic	Pipadone (B. & W.)
Fludrocortisone Acetate	Addison's crisis	Alflorone Acetate (M.S.D.) Cortef (Upjohn) Florinef Acetate (Squibb)
Glutethimide	hypnotic	Doriden (Ciba)
Halothane	general anaesthetic	Fluothane (Imperial)
Hexachlorophane	antibacterial effective in presence of soap	Hexachlorophene U.S.P. (many mfrs.)
Levallorphan Tartrate	antagonist to Levorphanol	Lorfan (Roche)
Hard Macrogol	Ingredient of water-soluble ointment bases	Carbowax 4000 (Carbide & Carbon)
Liquid Macrogol	as above	Carbowax 300 (Carbide & Carbon)
Mecamylamine Hydrochloride	treatment of severe essential hypertension and malignant hypertension	Inversine (M.S.D.)
Meprobamate	tranquillizer	Equanil (Wyeth) Miltown (Ayerst) Trelmar (Elliott-Marion) Neo-Tran (Neo)
Meralluride	diuretic	Mercuhydrin (Lakeside)
Mercaptopurine	in acute leukaemia and in chronic myeloid leukaemia	Purinethol (B. & W.)
Nitrofurazone	local antibacterial for superficial wounds, burns and ulcers	Furacin (Eaton)
Phenmetrazine Hydrochloride	anorexic	Preludin (Geigy)
Pholcodine Tartrate	cough supressant	Ethnine (A. & H.)
Pipradrol Hydrochloride	treatment of depressive states and narcolepsy	Meratran (Merrell)
Propylhexedrine	nasal decongestant	Benzedrex (S.K.F.)
Pyridostigmine Bromide	in myasthenia gravis	Mestinon (Roche)
Tolbutamide	treatment of mild diabetes mellitus in obese middle-aged subjects	Orinase (Upjohn) Mobenol (Horner)
Tripolidine Hydrochloride	antihistamine	Actidil (B. & W.)

G. R. PATERSON.

THE LOW COST OF LIVING — AN APPRAISAL FOR THE PHARMACIST

In recent months there has been adverse publicity particularly in the so-called "high cost" of drugs. It is the personal opinion of this writer that the majority of the people talking about this matter do not appreciate the situation and are not aware of all the facts. There has been a rather lax use of the word "generic" when it is coupled with the word "drugs". It seems to be a common misconception that the term "generic" and the idea of "inexpensive medication" are part of the same thought. It should be pointed out that "generic" does not in any way refer to cost, wholesale or retail, or profit. "Generic" is defined in the dictionary in two ways: (1) "race or kind" —in otherwords a classification; and (2) "opposed to specific". This latter definition is perhaps the better choice for our discussion if we consider the "trade name" or "proprietary" name as the specific name and the assigned or generic name as the other.

New and Nonofficial Drugs (N.N.D.), which was formerly called New and Nonofficial Remedies (N.N.R.), uses a designation in place of the term generic which is perhaps the better choice. The word used is "nonproprietary". New and Nonofficial Drugs is an annual publication of the Council on Drugs of the American Medical Association and contains descriptions (monographs) of drugs on the basis of scientific investigational data. This book has the status of an official compendium in Schedule B of the Food and Drugs Regulations.

However let us consider certain aspects of the "generic drug" problem. The general public has been assailed rather widely by extremely well planned public relations (sic) programmes chiefly in the newspapers, but also through other forms of public medium. Most of the time the information contained in this publicity is not completely inaccurate but neither is it completely accurate. Many factors must be considered by the pharmacist, the physician, the manufacturer, and the public. Many drugs marketed in Canada under their nonproprietary names are produced in countries outside of Canada where the scale of living is extremely low. Naturally in the production of any commodity regardless of its nature, labour costs must necessarily be considered. If, and I emphasize this, if the Canadian people are prepared to accept low labour salaries (average hourly wage in American manufacturing—$2.22 an hour, in Great Britain—67 cents, in Germany—58 cents, Mexico—35 cents, Japan—30 cents (cited in American Druggist, March 21, 1960, page 18) and a low standard of living such as exists in these countries, then, the drugs could unquestionably be marketed at a lower cost by the drug manufacturers in Canada.

However, more important than this is the consideration of the drug itself and the final form in which the drug is marketed. It is interesting to note a statement made by the Hon. J. W. Monteith, the Minister of National Health and Welfare for Canada, in reply to a question that was asked in the House of Commons on February 10, 1960 (Ontario Retail Pharmacists Association Bulletin). At that time the Minister indicated that the Food and Drug Section of the Department of National Health and Welfare does **not** assay **all** drugs coming

into Canada because the staff and facilities required for such a task would be overwhelming in number and **expense.** Spot checks are done, by the Department, on **all** companies' products. Further on in his statement, the Minister said that reputable manufacturers have adequate **control facilities** of their own. The necessity of adequate control facilities cannot be over-emphasized. It is this writer's considered opinion that **any** company having such **adequate** facilities is a reputable company. I do not feel that the size of the company, the number of products marketed, the cost of the product or the gross or net profit is a factor in "reputability". Naturally then this control is most important in any company's product and may well cost 10-15 per cent of the overall cost to the manufacturer.

The **Western Druggist,** February, 1960, contains a section of Questions and Answers about generic drugs. The first of the question deals with analytical control of the product, assay and control procedures and necessary in more places in pharmaceutical production than simply in assay of the final product, although this point of control is a most important point. This author, personally, feels that choice of "control of pharmaceuticals" was not a wise designation but rather one must consider the analysis and control factors throughout the entire process of manufacture. Let us consider then a tablet manufacturing process in valuing the procedure known as "Wet Granulation".

The chemicals or drugs are received by the manufacturer (if he does not prepare or synthesize the material himself) and although they may be labelled as B.P. or U.S.P. strength, etc., this is not sufficient for most manufacturers. The drug is "quarantined" and random samples are removed for assay. If the substance is the proper strength it is removed from the quarantined area to general bulk stock area; if it is not the substance is rejected. This control is exerted on all substances. When the particular tablet is to be prepared, the drugs (identified by a lot number) are removed to the manufacturing area and the process of wet granulation begun. Prior to this however, the Development section of the company has, after studying (or determining if necessary) the physical and chemical characteristics of the particular drug, formulated the tablet for stability, physiological availability of the medication, methods of assay for quality control etc. This formulation process may involve a considerable period of time to develop a suitable product.

When the drug has been formulated, granulated and finally compressed into the finished tablet, the tablet is tested for the fracture strength (the tablet must be firm enough for handling and its particular use, but not so hard it will not break down), the disintegration time and content of medication. Random samples are withdrawn for these purposes. Each batch or lot of tablets is assigned a batch number or a lot number, this number following the product throughout its entire manufacturing procedure and is printed on the label affixed to the container containing the tablets. Specimen bottles of the product with the lot number affixed are removed at random from the packing sequence and stored by the company for a period of time, this period is usually that considered to be far beyond the life expectancy of the product in question.

In the article in **Western Druggist**, the question asked was, "was there existing legislation to control the physical properties of a drug product?" The answer was "No". Perhaps we should look at sections of the Food and Drugs Regulations which **do** control physical properties of a drug (tablet).

C.01.011. Except as provided in C.01.012, no person shall sell a drug in the form of a tablet which is intended to be swallowed whole, unless the tablet disintegrates in not more than 60 minutes when tested by the official method.

C.01.012. The provisions of C.01.011 do not apply to tablets which are represented on the label as being enteric coated, or as having delayed action.

C.01.070. No person shall sell a drug that is a hypodermic tablet that does not completely dissolve in and form a clear solution with water.

It is obvious then that there is at least some control of the physical properties of a drug product. The average person might wonder why these sections are included. The main reason is that the Food and Drugs Research Laboratories have investigated a good many tablet preparations from various manufacturers and found that a simple compressed tablet (not delayed action or enteric coated) must break down in the period stated, otherwise the drug was not physiologically available to the body. The same research laboratories have done some excellent work in studying delayed action or enteric coatings and while no standards have been set by law at the date of writing, it is to be hoped that such a standard may be established. Naturally if a lack of availability of the drug exists, the same effect is achieved as no administration of the drug. In addition to these sections dealing with tablets, the Food and Drugs Regulations do cover such miscellaneous considerations as the excess volume required in ampoules, the choice of a preservative, the use of non-pyrogenic distilled water for aqueous solutions in ampoules, etc.

The Food and Drug Act is legislation which is designed to protect the public. As such it is a part of the criminal law of Canada. Any set of laws or legislation cannot guarantee that there will be compliance. For example, while it is illegal to ram the rear of the automobile ahead of you it is still done very frequently. If passing laws to eliminate any crime or offence, it would indeed be a simple matter for law enforcement, wouldn't it? As the Hon. Mr. Monteith stated, and previously noted, the staff and facilities for assaying each drug imported (or manufactured in Canada) and each pharmaceutical product imported (or manufactured in Canada) would be so huge as to be quite impossible. Obviously then, all that can be expected of legislation is that standards be set and that violations (when apprehended) be severely punished by fine and/or jail sentence. Such conditions presently exist. The rest is a part of the professional responsibility of the physician and the pharmacist and the manufacturer. The physician must diagnose the case and prescribe the best therapeutic agent possible; the pharmacist must compound and dispense the best (in his professional opinion) preparation; the manufacturer must take the necessary steps to prepare the drug in the most stable and most therapeutically effective form and should stand unhesitatingly behind his

product. The Food and Drug Division of the Department of National Health and Welfare does selective checks on drug manufacturers and in this manner a control is exerted. Unfortunately, all that can be done in the event that there is a violation of the Act is that the particular batch of the drug can be condemned and a withdrawal of the batch from the market be forced, together with the fining and/or imprisonment of the individual concerned. One should remember, however, that, while it is possible to fine a Corporation for a violation one cannot imprison the physical facilities of the company.

An additional question asked in the **Western Druggist** article dealt with the fact that some departments of the Federal Government use drugs which "cannot be guaranteed". Government contracts are awarded by tender and bid and while the lowest tender or bid may not necessarily be accepted, it is not infrequent that such may be the case. This situation is not unique with pharmaceutical purchases. Bridges, buildings, etc. are all awarded in this fashion and of course it is not impossible that there might be faulty construction of such. It does seem a shame, however ,that where the health of an individual is concerned that there may be an inferior product purchased. Perhaps the answer would be in the assay, by the government agency, of each batch of each drug (irrespective of the manufacturer) at the time of purchase.

Continuing in the **Western Druggist,** the question asked was "Does the practice of prescribing and dispensing generic or chemical name drugs rather than brand names reduce the cost to the patient?" The answer was "Yes, it reduces the cost but it is important to realize that there is no guarantee of the quality of such product". I would not agree with the reply to this question. Cost of drugs is not governed by non-specificity (generic or chemical names). However, many manufacturers marketing drugs under the generic or chemical name do market these drugs at a lower cost. It would seem doubtful if there would be any differential between the price of a manufacturer's "brand name" product and a nonproprietary (generic) name for the same product, by the same manufacturer.

What then should the pharmacist know and do? Frequently he is asked about the "high cost" of drugs. The preceding portion of this paper has indicated some of the problems and factors involved from the point of view of the government, the manufacturer, the pharmacist and the patient. Unfortunately too many pharmacists tend to shy away from answering questions or do answer in a vague or inadequate fashion. The frequent response to this question of cost of medication is "Yes it is, isn't-it?" or "Well, this is what the company charges me, I don't fix the prices". These responses are "alibis" or "evasions" but certainly do not answer the question. The pharmacist should not be afraid to face facts and discuss intelligently, with any individual or customer, this situation. Research in any field is essential but costly. For every successful project or drug developed there are hundreds that are not usable. Consider the millions of dollars used in research on the Avro Arrow which was subsequently scrapped. Consider the number of unsuccessful satellite and rocket launchings in the United States—each rocket costing several million dollars. Con-

sider the amount of money spent each year on medical research, such as Cancer research. A justifiable expense it is true but none the less an expense. The research involved in the search for new medicinal agents to treat and wipe out disease is just as justified. Of all the drugs synthesized and tested only a mere fraction of a per cent can be successfully marketed by the pharmaceutical manufacturer and research must continue to be paid for. This is a portion of the cost of a drug. The physical facilities, buildings and equipment, necessary for developing and marketing products are other factors in the cost. The labour cost (salaries) are not low. This too is a factor. The cost of disseminating the information (for ethical products) to those persons who, as a portion of their professional responsibilities, must be kept aware of the facts and status of new drugs, namely, pharmacists, physicians, dentists and nurses, is a factor. All of these are but a few of the items which go into the cost of a drug or a drug product and must be considered. Surely the best way for the average pharmacist to deal with the situation is to be honest and frank. The biggest and most telling selling point that he has is his professional reputation and integrity. Without this he is a nonentity. The pharmacist owes it to his customer to supply only those drugs or drug products which he himself feels are of the best quality. The best feeling of security a customer can be given, will be given when the pharmacist can honestly assure that customer that the medication dispensed is of a quality that the pharmacist would supply for himself if he were ill with a similar condition.

Health is taken as a commonplace thing. We expect it and are quite amazed and annoyed even, when illness strikes. In many parts of the world the people consider it fortunate if a portion of the babies born live long enough to grow up to young manhood or womanhood. Not so here — we expect it as a natural thing — our now exceeded "three score and ten" years of life expectancy. Today's public in the United States and Canada will buy all sorts of luxuries "on time" with "easy payments". The purchase of a television set for instance is one example which might be noted. The public will "keep up" the purchase payments because if they do not then the set will be reclaimed for failure of payment. Health when restored by medication treatment of an illness cannot (nor should it be) "reclaimed". When one considers the reduction in expense, during illness, of hospital (even though we have a hospitalization plan) bills, medical bills, expense due to lost man hours of labour — surely then there is no "high cost of medication" but rather a "low cost of medication".

However, the pharmacist, on a prescription request for a non-proprietary drug **must** supply on a drug of a high standard of quality and one which he, with his professional knowledge, knows to be a "good brand". An old latin expression is seen around still. It is "caveat emptor"—"let the buyer beware".. This is the old idea of buying a "pig in a poke". This situation cannot and should not exist where an individual's health is concerned. So I would say to all the pharmacists in Ontario — "Caveat emptor" may well apply to **you** but should **never** apply to your customer or in plain English, **quality** should take preference over **price** every time.

D. R. KENNEDY.

Dr. F. W. Teare

THE VALUE OF A PHARMACEUTICAL ANALYSIS COURSE TO A FUTURE RETAIL PHARMACIST

Questions raised by some students in Pharmacy concerning Pharmaceutical Analysis courses are frequently similar to the following examples. "Why should a student who has elected to enter the field of retail pharmacy take a pharmaceutical analysis course?" "Are you going to make quality control chemists of us all?" "Doesn't this course concern only those entering industrial or hospital pharmacy, government service or graduate studies?" When will a retail pharmacist ever perform analysis in the dispensary?" and so on.

These questions are all worthy of an answer but they also reveal a lack of appreciation for knowledge which cannot directly be applied to the task of making money upon graduation. Every pharmacist regardless of his eventual specialization is concerned with drugs either directly or indirectly. Drugs are chemicals whether organic or inorganic, of natural or synthetic origin, crude or pure. Is it not then realistic to expect and demand that any person who is to qualify for the role of a responsible and legal custodian of drugs and poisons must have an adequate understanding of the nature, potency, and action of these substances? In short he must be adequately grounded in several branches of chemistry including biochemistry, inorganic and organic chemistry, as well as qualitative and quantitative analysis. Regarding the latter two, more application to drugs is necessary than is possible in a general introductory course common to most science students. The applied pharmaceutical analysis course does not teach a series of isolated or unrelated analysis but attempts to teach general concepts of both chemical and physico-chemical analysis by relating the experience obtained in experiments with particular drugs or chemicals to a class of compounds having similar reactive or functional groups. Each laboratory exercise teaches a new technique and chemiprinciple or repeats some of these in modified form to enable the student to develop more skill. Quantitative pharmaceutical analysis, or drug assay, is one of the best means of sharpening an individual's attention to detail in that the slightest carelessness precludes an accurate assay result. In this way the importance of accounting for small quantities of potent drugs, at each step of an assay procedure requiring several quantitative manipulations, is brought to the students attention. The same care is required in compounding a very potent drug but the awareness of the possibilities for drug loss involved in the process would not be obvious unless the final prescription was assayed.

The continuing need for classical methods of pharmaceutical analysis is an indirect one. The most immediate benefit is seen in the fact that such a course demands that a certain level of skill be

acquired by the student before, or concurrently with, the final course in compounding and dispensing. A specific skill which is developed in pharmaceutical analysis is the ability to measure small volumes of liquids with precision. At the same time the student is made aware that this precision cannot be attained with just any piece of volumetric equipment which happens to be available but rather he appreciates the need for accurately calibrated volumetric ware of the proper capacity. Another similar skill and awareness is developed when weighing out assay samples on a very accurate analytical balance. I am not advocating here the use of pipettes, burettes, or analytical balances for general compounding, but rather the need for the proper attitude, the care, and the attention to details that are required in assays, to be applied to everyday compounding and dispensing. Pharmacists are expected to be skilled in such matters and we must ever be on guard against careless habits which readily creep into dispensing practice.

It is unfortunate that there are a few among us who do not appear to be too concerned with "care and diligence." This fact has been brought out from time to time by reports of surveys dealing with the degrees of accuracy involved in prescription compounding. Prescriptions for ointments, solutions, hand-filled capsules and the like have been submitted to various groups of pharmacists for filling. The pharmacist did not realize that the prescription was not for the patient submitting it. These prescriptions were then taken to some government or other laboratory for analysis only to reveal some shameful carelessness on the part of some pharmacists. Such surveys point out very dramatically the need for even greater emphasis on precision in compounding. The fault may be due to the attitude of certain pharmacists or due to inadequate equipment. It is not sufficient to adopt the attitude that any old balance or any volumetric glassware is adequate to compound most prescriptions. The public and the medical profession quite rightly expect that **every** prescription will be compounded not only with high quality compounds but by an alert precision-conscious pharmacist who uses adequate care and proper equipment in fulfilling his profession's obligations.

In a pharmaceutical analysis course a student also becomes aware of the different grades of drugs or chemicals. He soon learns that the ultra-pure reagent grades are required for accurate analysis but are rarely needed for medicinal purposes. The presence of so-called impurities which must be eliminated at great expense for analytical purposes produce no adverse effect in therapeutic agents. On the other hand the presence of certain impurities present in technical grades are often undersirable for medicinal purposes and may also produce instability in finished pharmaceuticals such as vitamin preparations. Inadequate storage facilities for less stable products can readily be demonstrated by assays performed by the students on properly and improperly stored dosage forms. Pharmaceutical analysis is usually taught in one of the senior years and requires prerequisite courses in physics, chemistry, mathematics, and basic pharmaceutical principles or physical pharmacy. The pharmaceutical analysis course then, not only affords the opportunity for a student to integrate knowledge and skills acquired in former years but also reviews and extends this knowledge in a more applied fashion.

In recent years increasing emphasis has been placed on physico-chemical methods of analysis employing instruments. Since there are very few research papers published today which do not describe or mention the use of some particular instrument employed in obtaining the data presented, it is imperative that all pharmacy students receive an introduction to at least a few analytical instruments. If this aspect of his training is neglected, the modern pharmacist will be denied any real appreciation of the precision, or lack of it, which is involved in determining the data reported in a large segment of present day pharmaceutical literature. Frustration can hardly be created more quickly in the reader if he is unable to understand an author writing in what he supposed was his field. The particular instrumetal analysis to which pharmacy students are introduced to, include photoelectric colorimetry, spectrophotometry, fluorimetry, potentiometric titrations and pH determinations, chromatography and others. Several modifications of the classical methods have also been introduced, for example non-aqueous titrations which frequently permit assays to be performed without extensive separation of the active principle prior to titration.

The use of instruments in analysis does not preclude the need for accurate measurement of volumes, weights, or the use of calculations which are involved in the use of classical methods of analysis. On the contrary, the limits of certain instrumental assay errors are often dependent on errors involved in reading a burette, for example in potentiometric titrations. The accurary with which an assay sample is weighed out as well as the precision used in preparing the final test solution often determines the magnitude of error involved in colorimetric analysis. In most cases instruments merely serve to sharpen the end-point detection in titrations or extend the lower limit of concentration required for an accurate analysis. The desirable training in understanding and performing measurements and calculations involving stoichiometric relationship is usually retained or perhaps even increased in most methods of instrumental analysis.

The pharmacist's training should not attempt to duplicate unnecessarily certain aspects of the physician's training but should seek to complement it. To do this more intensive courses in chemistry are needed, particularly in pharmaceutical chemistry about which the physician has a very limited knowledge. Surely the knowledge of physical and chemical characteristics of general groups of therapeutic agents is essential if the future pharmacist is to recognize and avoid possible inactivation of drugs by such means as hydrolysis, a change in pH, interaction between active ingredients or other constituents to form insoluble or otherwise undersirable products, in compounded prescriptions. If the present graduates were encouraged to use the training they now receive in all branches of chemistry they could reduce markedly the need for much of the duplication which exists in such products as those to which acetylsalicylic acid or its various derivatives have been added. Such a move would not only recover more shelf space but markedly reduce the cost of certain products of this type.

While performing pharmaceutical analysis the student is made aware of the relative solubilities, the degree of basicity or acidity and thus the degree of chemical reactivity of a host of pharmaceuti-

cally important chemicals and drugs. This awarness may be brought out by the solubility of the assay sample in various solvents, or the reactivity of the drug with standard chemical reagents which have become familiar to the student due to previously acquired experience and knowledge. After analyzing a number of standard dosage forms, the student becomes familiar with the relative proportions of active drug to inert excipients or vehicles. This creates an unconscious awareness of the problem of, and need for, uniform distribution of active ingredients in finished products whether they be compounded by him, manufactured on a large scale, or merely resuspended prior to dispensing. The importance of following the "shake well" instructions on a bottle of emulsion or suspension to obtain accurate dosage is brought to the attention of the student who neglects to take the necessary precautions to obtain a representative sample of such a preparation for drug analysis. The results of repeated assays by the student demonstrate even more clearly this same lesson.

Pharmacy students get the opportunity to see first hand and to learn by experience what is involved in many control procedures. This enables them to select more wisely the products offered by many manufacturers who may not have equally high standards of ethics, or equal facilities for manufacturing and proper quality control. Those having experience in pharmaceutical analysis courses are better able to judge whether the price differential between two apparently identical products represents the costs involved in maintaining modern control laboratories. The latter involves adequately trained control chemists, the necessary special equipment, high standards of purity and other specifications. Part of this awareness is created when the student attempts to perform these assays himself in the laboratory. He must realize then, and most students do, that they are not being trained as quality control chemists in their first, and perhaps only, course in pharmaceutical analysis. A student who elects to enter this field of pharmacy would take more advanced courses in analysis, especially instrumental analysis. Even then, a future control chemist is not "graduated" as such but merely prepared by means of fundamental and applied courses in his chosen field. It takes years of experience and continued self-education to make a first class control chemist.

Since most recent graduates realize what is involved in such work. they must also realize that quality control is absolutely essential to the modern pharmaceutical industry and in large measure accounts for the "high cost" quality pharmaceuticals. This appreciation should not be allowed to slip away but rather it should be used to enlighten the public and allied professions so that they might better appreciate the quality of ethical products available to them from the dispensaries of Pharmacy.

F. W. TEARE

THANK YOU!

Our thanks to all the pharmacists who have carried the story of "Careers in Pharmacy" into the secondary schools of the Province. The response to the appeal for active participation in our recruitment campaign has been most encouraging.

We would also like to thank those who have contributed information as to those eligible for 50 year certificates.

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SCHEDULE F OF THE FOOD AND DRUGS ACT

Additions and Revisions of April 13, 1960 (P.C. 1960-500)

Additions to Part I of Schedule F.

Methaminodiazepoxide and its salts
Phendimetrazine and its salts
Pheniprazine and its salts

Addition to Part II of Schedule F.

Aminoglutethimide

Change in Part II of Schedule F.

Hydantoin derivatives and their salts (except preparations for external use only).

Explanatory Notes

1. Methaminodiazepoxide hydrochloride is a psychotherapeutic agent (ataractic and muscle relaxant) submitted by Hoffmann-LaRoche Limited and proposed to be sold under the trade name **Librium.** Chemically this drug is 7-chloro-2-methylamino-5-phenyl-3H-1, 4 benzodiazepine 4-oxide hydrochloride.

2. Phendimetrazine bitartrate is an appetite depressant drug submitted by Ayerst, McKenna & Harrison Limited, proposed to be sold under the trade name **Plegine.** This drug is closely related chemically to phenmetrazine from which it differs by having an additional methyl-group.

3. Pheniprazine hydrochloride is a psychic energizer drug submitted by Lakeside Laboratories, Inc. and proposed to be sold under the trade name **Catron.** Chemically the drug is beta-phenylisopropylhydrazine hydrochloride.

4. Aminogluthethimide is an anticonvulsant drug submitted by Ciba Company Limited and proposed to be sold under the trade name **Elipten.**

5. The change in the "Hydantoin" entry excludes these drugs for external use since some of these (notably Allantoin) are used in cosmetic preparations. For their therapeutic effect as anticonvulsant or antiepileptic drugs, which was the reason for their original inclusion, they must be given internally.

6. There is also one correction in spelling in the list in that the former entry "Isocarboxazide and its salts" has been changed to "Isocarboxazid and its salts". This conforms with the ending of other chemically related compounds.

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